

26th, Auburn, Bermuda, Brewton, Claiborne, Gadsden, Healing Springs, Highland Home, Livingston, Lynn, Mobile, Montgomery, Tallassee, Tuscaloosa, and Warrior, Ala.; Fort Smith, Ark.; Pensacola, Fla.; Adairsville, Americus, Athens, Atlanta, Dahlonaga, Dublin, Forsyth, Lagrange, Marietta, Millen, Mill-edgeville, and Morgan, Ga.; Eufaula and Gwenddale, Ind. T.; Calhoun, Delhi, Monroe, and Shreveport, La.; Briers, Canton, Crystal Falls, Edwards, Fayette, Kosciusko, Louisville, Meridian, Moss Point, Palo Alto, Vaiden, Vicksburg, and Washington, Miss.; Bryson City, Chapel Hill, Fayetteville, Lenoir, Lillington, Littleton, Newbern, Oak Ridge, Raleigh, Smithfield, Soapstone Mount, Southport, and Wilmington, N. C.; Aiken, Camden, Cheraw, Effingham, Longshore, and Nichols, S. C.; Highland and Palestine, Tex.; Clarksville, Va. 27th, Jacksonville, Moseley Hall, and Tallahassee, Fla.; Augusta, Bainbridge, Canton, Cordele, Elberton, Fort Gaines, Hephzibah, Louisville, Piscola, Poulán, Point Peter, Savannah, and Thomasville, Ga.; Charlotte, Columbus, Douglas, Louisburg, Marion, Mount Holly, Roxbury, Salisbury, and Saxon, N. C.; Sac and Fox Agency, Okla.; Charleston, Columbia, Greenville, Saint Stephens, Simpsonville, Statesburg, Tillers Ferry, and Wateree, S. C.; Sulphur Springs, Tex.; Nottoway, Va. 30th, Anadarko, Okla. 31st, Menardville, Tex.

## HAIL.

Description of the more severe hailstorms of the month is given under "Local storms." Hail was reported as follows: 3d, California and New Jersey. 5th, Arizona and California. 6th, Louisiana, Maryland, New York, and Texas. 7th, Illinois, Michigan, and South Carolina. 8th, New York, Pennsylvania, and West Virginia. 11th, Nevada and Texas. 12th, Arizona and Texas. 13th, Maryland, New Jersey, and Pennsylvania. 18th, Pennsylvania and Texas. 19th, Maryland and Mississippi. 20th, Pennsylvania. 21st, Mississippi. 25th, Colorado, Nevada, and Pennsylvania. 30th and 31st, Texas.

## WINDS.

The prevailing winds for December, 1892, are shown on Chart II by arrows flying with the wind. In the middle Atlantic and New England states and the Missouri Valley the winds were generally from the northwest; in the south Atlantic states, over the Florida Peninsula, over the southern plateau region, and along the south Pacific coast, from northwest to northeast; in the east Gulf states, from northwest to north; in the west Gulf states, from north to east; in the lower lake region and on the northeast slope of the Rocky Mountains, from southwest to northwest; in the upper lake region, from southwest to west; in the extreme northwest and on the middle and southeast slopes of the Rocky Mountains, from west to north; in the upper Mississippi valley and on the California coast, from west to northwest; over the middle plateau region, from southeast to southwest; on the north Pacific coast, from east to southeast; in the Sacramento Valley, California, in the Ohio Valley and Tennessee, and over the northern plateau region, variable.

## HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 1st, 66, s., at Fort Canby, Wash. 2d, 56, s., at Fort Canby, Wash. 7th, 50, sw., at Chicago, Ill. 20th, 56, n., at Kittyhawk, N. C.; 54, ne., at Tatoosh Island, Wash. 21st, 84, e., at Tatoosh Island, Wash. 22d, 70, e., at Tatoosh Island, Wash.; 56, w., at Cheyenne, Wyo.; 52, se., at Fort Canby, Wash. 23d, 83, e., at Tatoosh Island, Wash.; 60, se., at San

## SLEET.

Description of the more severe sleetstorms is given under "Local storms." Sleet was reported as follows: 1st, Maine, Montana, North Dakota, and Utah. 2d, Indiana. 3d, Connecticut, New Jersey, and Pennsylvania. 4th, Tennessee, Utah, and Wisconsin. 5th, Arizona, Nebraska, Utah, Washington, and Wisconsin. 6th, Connecticut, Iowa, Kansas, Maryland, Massachusetts, Nebraska, Ohio, Pennsylvania, Washington, and Wisconsin. 7th, Illinois, Iowa, Kansas, Massachusetts, Michigan, Missouri, Nebraska, and Wisconsin. 8th, North Dakota. 9th, Louisiana and Wisconsin. 10th, South Carolina.

11th, Arizona, Arkansas, Illinois, Missouri, Nebraska, and Texas. 12th, Arkansas, Kansas, Mississippi, Missouri, Ohio, Oklahoma, Oregon, and Tennessee. 13th, Arkansas, District of Columbia, Illinois, Iowa, Kansas, Maryland, Missouri, New Jersey, Ohio, Pennsylvania, Virginia, and Wisconsin. 14th, Maryland, Ohio, Pennsylvania, and Texas. 15th, Nebraska, Pennsylvania, Utah, and Washington. 16th, Illinois, Nebraska, Texas, Virginia, and West Virginia. 17th, Arkansas and Texas. 18th, Arizona, Arkansas, Maine, Montana, and Ohio. 19th, Arkansas, Maryland, Mississippi, North Carolina, Ohio, Pennsylvania, and Virginia. 20th, Arkansas, Mississippi, and Nebraska.

21st, Mississippi, Oklahoma, and Virginia. 22d, Nebraska, Oregon, and Pennsylvania. 23d, Kansas and Washington. 24th, Kansas, Nevada, and Pennsylvania. 25th, Arkansas, Illinois, Missouri, Nebraska, and Utah. 26th, Alabama, Arkansas, Florida, Georgia, Mississippi, Missouri, Montana, North Carolina, and South Carolina. 27th, Florida, Georgia, Kansas, and South Carolina. 28th, California, Georgia, Missouri, and New Mexico. 29th, Kentucky, Nebraska, Nevada, and Oklahoma. 30th, Arkansas, Illinois, Kentucky, Mississippi, and Missouri. 31st, District of Columbia, Kentucky, Missouri, Pennsylvania, and Virginia.

## LOCAL STORMS.

**1st-3d.**—High wind and heavy rain prevailed in California; oranges were injured by wind, and rain caused floods throughout the greater part of the state.

**5th.**—At Salt Lake City, Utah, rain changed to snow in the early morning, and snow continued until about midnight; street car traffic was interrupted.

**6th.**—Tornadoes were reported in northeastern Texas and Arkansas. A tornado moved northeast east of Atlanta, Tex., between noon and 1 p. m., attended by heavy rain, small hail, thupder, and lightning. The storm had a whirling motion, and the path of destruction was 400 yards or less in width. One person was killed, 20 were injured, and 8 or ten small houses were destroyed. Two clouds, one from the northwest, the other from the southwest, united, and a black funnel-shaped cloud with a white center appeared. The track of the storm was swept clean, and the edges were well defined. Trees were twisted, and pieces of timber and articles from the wrecked houses were found on either side of the track. A

pot 150 pounds in weight was carried 200 yards and left in the track. Two boys were carried some distance, one being found 200 yards from the house. Cotton plants were stripped and many were torn up by the roots.

A tornado moved east about 6 miles northeast of Brenham, Tex., at 5.30 p. m., attended by light rain, hail, and vivid lightning. The length of the path of this tornado was about 10 miles. Articles were carried up. The center of the track was swept clean and debris was scattered on either side. The destruction to property was estimated at \$10,000. A funnel-shaped cloud moving northeast was observed near Queen City, Tex. The storm was attended by heavy rain and small hail, and was destructive in a path 100 to 300 yards in width. One man and a number of horses were killed. On the north side of the path articles were thrown southeast, on the south side northwest, and in the center in all directions.

A tornado moving northeast, with rain, hail, heavy thunder, and vivid lightning, was reported near Elkhart, Tex., at 11 a. m. The path of destruction was about 200 yards in width. Two persons were injured, large trees were uprooted, a few houses were destroyed, and a number of buildings were unroofed. A destructive tornado was reported in Nacogdoches county, Tex., about 2 p. m. The storm appears to have followed an irregular northeast course in a path about 10 miles in length and 300 yards in width, wrecking buildings, etc., in its path. At Palestine, Tex., a thunderstorm from the west, with heavy rain, began 9.20 a. m. and ended 10.20 a. m. Heavy rain again began 4.40 p. m. and ended 9.20 p. m.; 2.74 inches of rain fell in 12 hours. Considerable damage was caused by high wind six miles southeast of Palestine.

A severe storm visited Paragould, Ark., at 11 p. m. The path of the storm was about 200 yards in width. Many residences were moved from their foundations, trees were prostrated, and outbuildings wrecked. Estimated damage, \$20,000. Unusually heavy snow in central and eastern Kansas, eastern Nebraska, and central Iowa delayed trains.

**12-13th.**—Exceptionally heavy rain fell at Memphis, Tenn., with a thunderstorm the evening of the 12th; 4.50 inches of rain fell in 23 hours and 20 minutes, and 3.22 inches in 12 hours.

**13th.**—A destructive tornado was reported in Pike county, Miss., at 9.30 a. m.; 4 persons were reported killed, 7 injured, and a number of buildings were damaged. A destructive storm was reported at Clinton, La., at 8.30 a. m. A heavy sleet and snow storm prevailed over eastern Kansas and parts of western Iowa and western Missouri.

**17th.**—A severe "norther" prevailed at Los Angeles, Cal.

In the San Gabriel and Altadena sections oranges were damaged by wind.

**19-20th.**—Rain and high wind prevailed along the Virginia coast; several vessels were wrecked and one life was reported lost. Gales continued along the south Atlantic and Virginia coasts during the 20th.

**20-25th.**—Exceptionally severe storms prevailed over the Pacific coast states. Heavy snow prevailed over Washington from the 21st to the 23d, causing damage to property and interrupting railroad traffic. At Tatoosh Island, Wash., an east gale prevailed from the 21st to the 23d, reaching a maximum velocity of 83 miles per hour at 7.35 p. m., 23d. At Olympia, Wash., 2 feet of snow fell from the 20th to 22d. At Port Angeles, Wash., the depth of snow exceeded one foot. At Portland, Oregon, about 2 feet of snow fell on the 22d and 23d; this was the heaviest snowfall on record at that station. At Baker City, Oregon, rain, with a southeast gale, prevailed during the 24th; some damage was caused by wind.

At Roseburg, Oregon, the barometer fell to 29.02 at 5.15 p. m. of the 24th. Rain continued at intervals during the morning. A gale began at 5.50 p. m. and the wind reached an extreme velocity of 56 miles per hour, the highest velocity ever recorded at station. Considerable damage of a minor character was caused by wind in and about Roseburg. At Eureka, Cal., the wind increased to a gale by midnight of the 22d, and the barometer fell to 29.17 (reduced) the morning of the 24th. At 1.30 p. m. of the 24th the barometer began to rise and the wind shifted suddenly to southwest and blew with great force, causing much damage to buildings. Streams in the surrounding country were flooded by heavy rain.

At San Francisco, Cal., rain and high southeast winds continued from the 22d to the 24th; much damage was caused by wind. At Keeler, Cal., rain began the evening of the 23d and continued during the 24th. At 12.10 a. m. of the 25th the pressure decreased suddenly and the wind increased from 10 to 50 miles per hour, with gusts from the southwest. Mountain streams north of Keeler were flooded.

**25-26th.**—Heavy snow and high winds delayed trains in eastern Kansas.

**26-27th.**—Exceptionally heavy snow fell in Virginia and the south Atlantic and east Gulf states. High winds prevailed along the Virginia and south Atlantic coasts. On the 27th a bark went ashore and was wrecked on the "Quicksands," 35 miles west of Key West, Fla.; the crew was saved.

**29-30th.**—An unusually severe windstorm visited Flagstaff, Ariz.; buildings were blown down, houses were unroofed, and trees were uprooted.

## INLAND NAVIGATION.

### ICE IN RIVERS AND HARBORS AND CLOSING OF NAVIGATION.

The Kennebec River was closed by ice on the 17th.

The Connecticut River was closed by ice on the 24th.

Navigation closed on the upper Hudson River on the 22d. On the 25th the river was frozen at Albany, N. Y. Navigation on the Hudson between New York and Poughkeepsie closed on the 27th.

On the 24th navigation on the Delaware River between Burlington, N. J., and Philadelphia, Pa., was suspended. On the 28th the Delaware was frozen at Beverly, N. J.

The canal and Raritan River were frozen at New Brunswick, N. J., on the 24th.

On the 25th, at Philadelphia, Pa., the Schuylkill River was covered with thin ice, and ice was forming rapidly on the Delaware River. On the 28th many vessels were unable to enter or leave the port of Philadelphia on account of heavy ice in the river.

The Clarion River was frozen over at Clarion, Pa., on the 23d.

Floating ice was reported in the Susquehanna River at Towanda, Pa., on the 20th and 21st. The Susquehanna was frozen at Lock Haven, Pa., on the 22d.

Navigation on the Allegheny River closed at Freeport, Pa., on the 23d. Navigation on the Monongahela River closed at Greensboro, Pa., on the 26th.

The Patapsco River was frozen at Woodstock, Md., on the 25th.

From the 27th to the 29th the Pamlico River was closed by ice at Washington, N. C.

Floating ice was reported in the Roanoke River at Weldon, N. C., on the 27th and 28th. On the 29th the Roanoke was closed by ice at Littleton, N. C.

Floating ice was reported in the Pedee River, at Cheraw, S. C., from the 29th to 31st.